Geographic Information System (GIS) Usage

Adding GIBS layers to ArcGIS Online as Several GIS and imagery viewing tools support access to NASA's Global Imagery Browse Services (GIBS) via OGC Web Map Tile Service (WMTS) and Tiled Web Map Service (TWMS) protocols. Listed below is a set of these tools along with instructions and screen captures to help import imagery into them.

Please note: many existing GIS applications and the OGC WMTS specification do not currently handle time-varying imagery layers. We are actively working with OGC to address this issue. In the meantime, one of the simplest methods of importing GIBS imagery into your GIS application is to use Worldview's "image capture" tool (camera icon in upper right) to export imagery as a GeoTIFF which can then be imported into your application.

ESRI ArcGIS/ArcMap

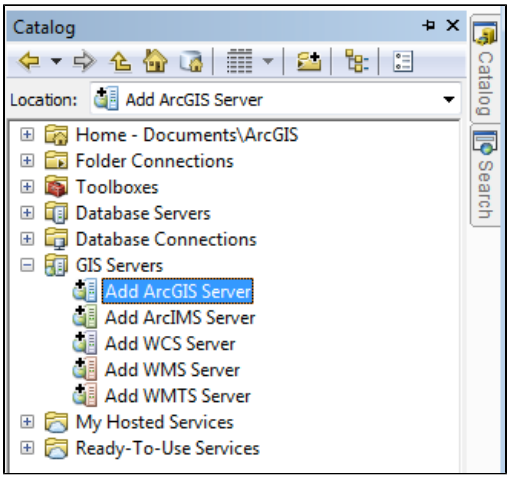
GIBS imagery layers can be directly imported into ESRI ArcGIS/ArcMap 10.2.1 or later. It uses an ESRI-run relay service which adds an ArcGIS Server interface layer in front of GIBS.

Requirements

- ESRI ArcGIS ArcMap 10.2.1 or later (earlier versions are untested, though possibly usable)

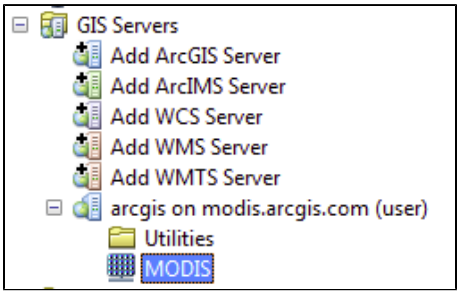
Instructions:

- Open the "Catalog" window in ArcMap and "Add ArcGIS Server":



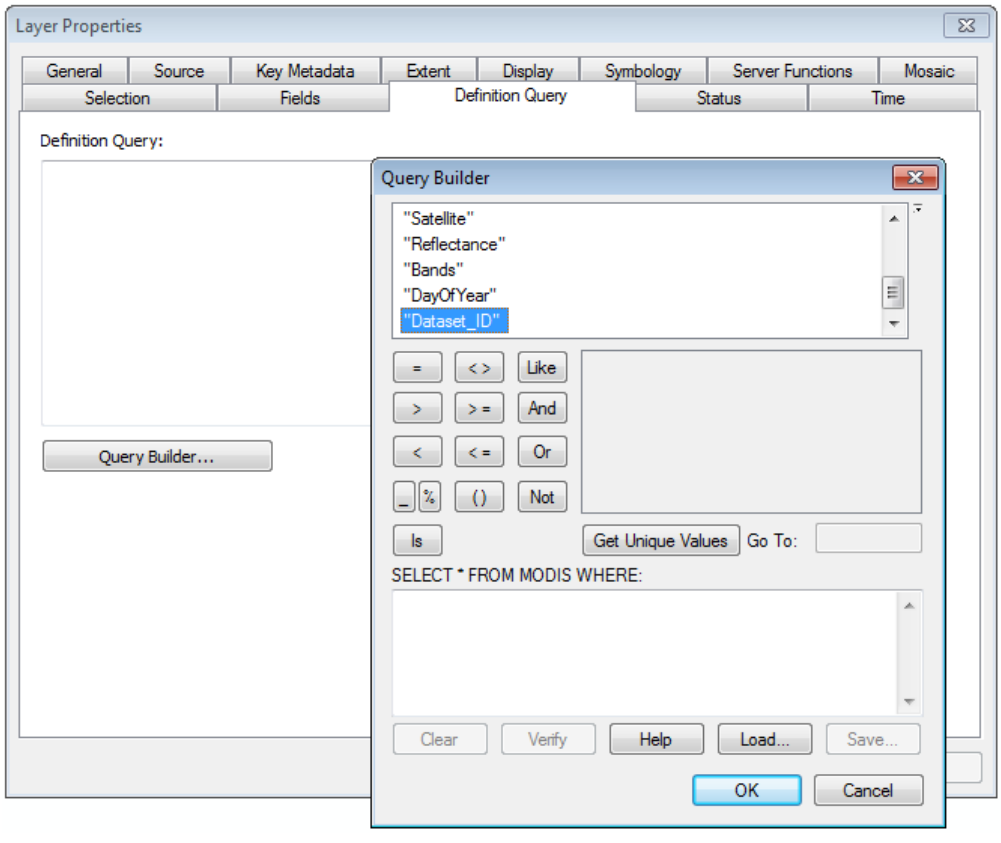
- Choose "Use GIS Services"
- Enter "http://modis.arcgis.com/arcgis/rest/services/MODIS/ImageServer" as the Server URL and click "Finish".

  A "MODIS" layer type should appear in your GIS server list:

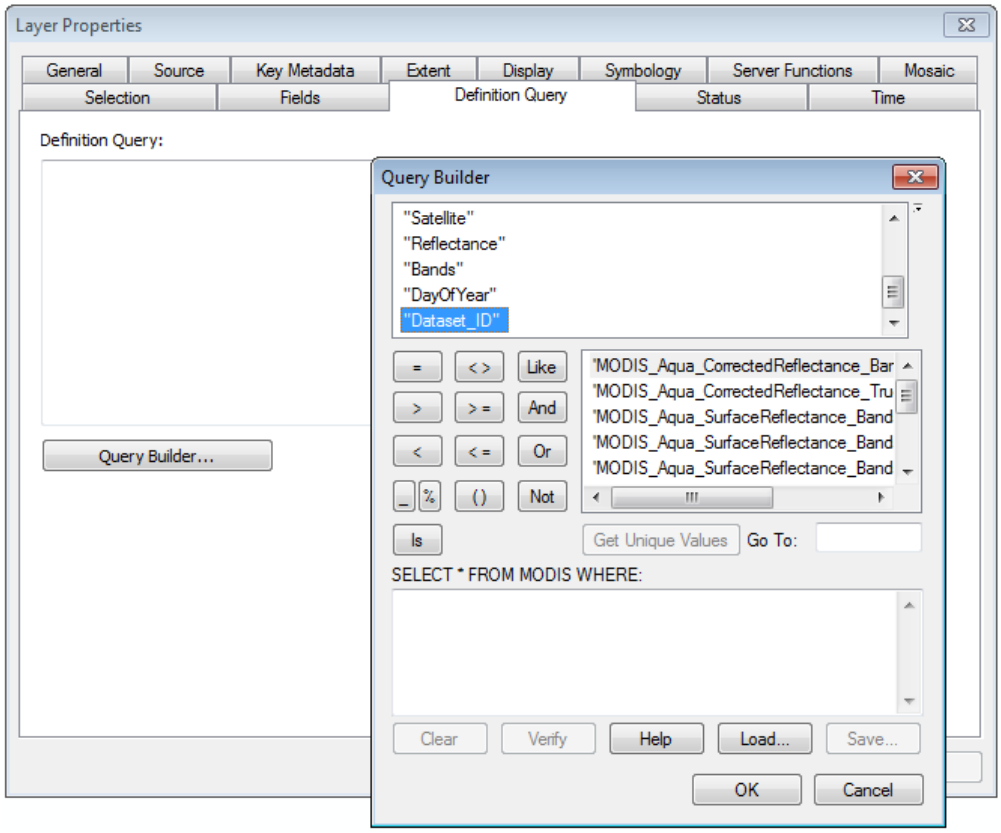


- Drag that to your layer list:

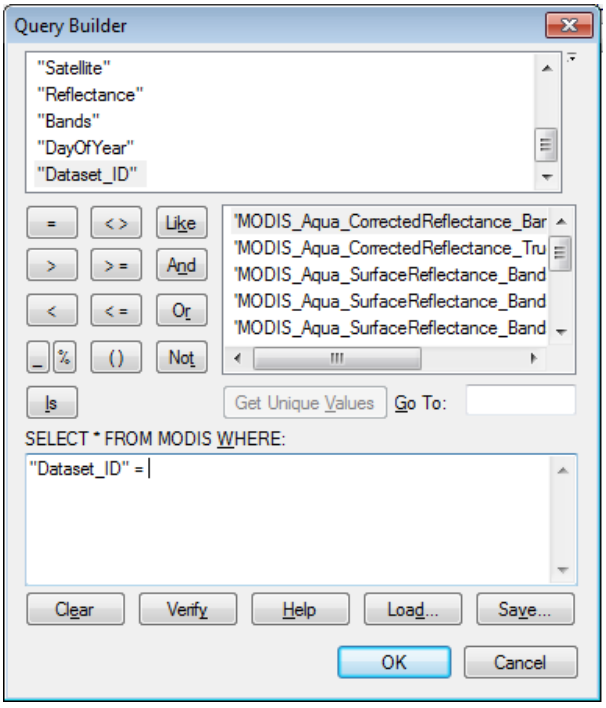
- To adjust the visible layer, right-click on "MODIS", then "Properties...".
- Go to the "Definition Query" tab and click "Query Builder..."



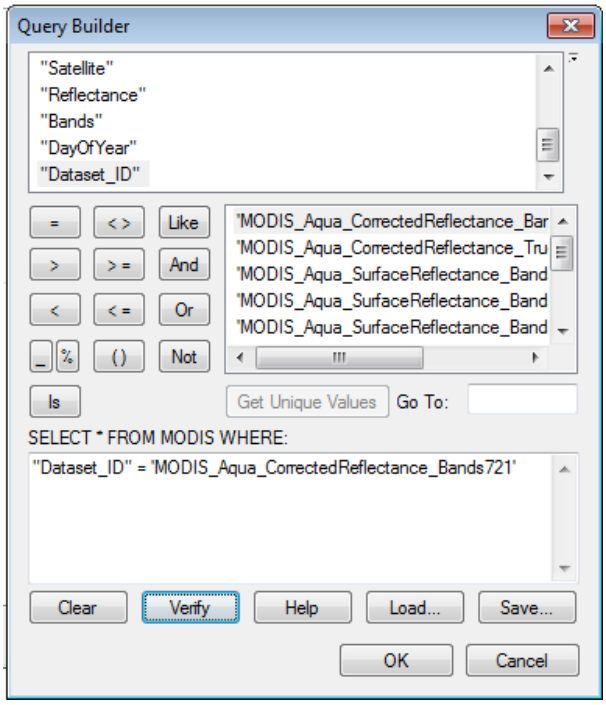
- Select "Dataset_ID" from the list at the top and then click the "Get Unique Values" button:



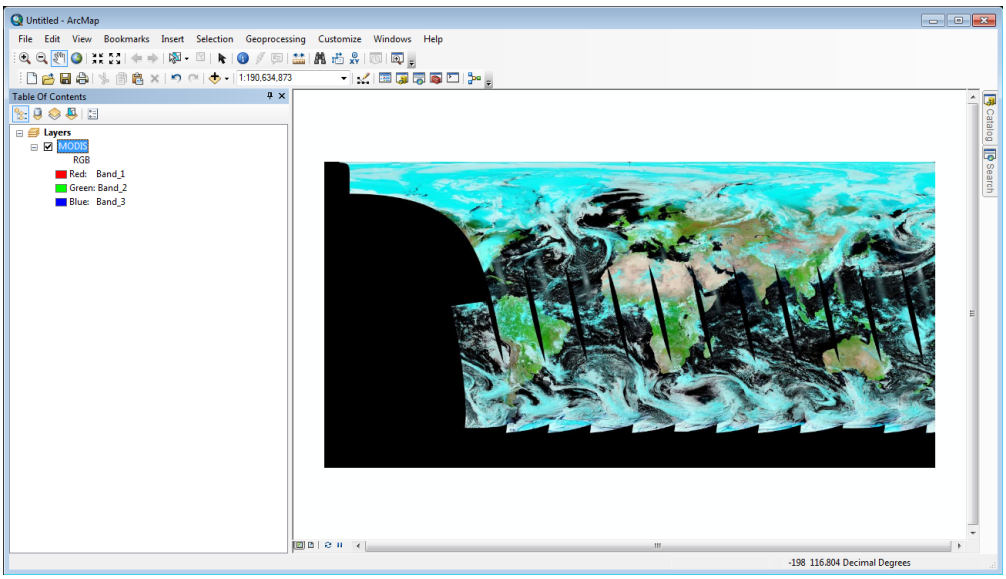
- In the box below "SELECT * FROM MODIS WHERE:", enter "Dataset_ID" = as shown here:



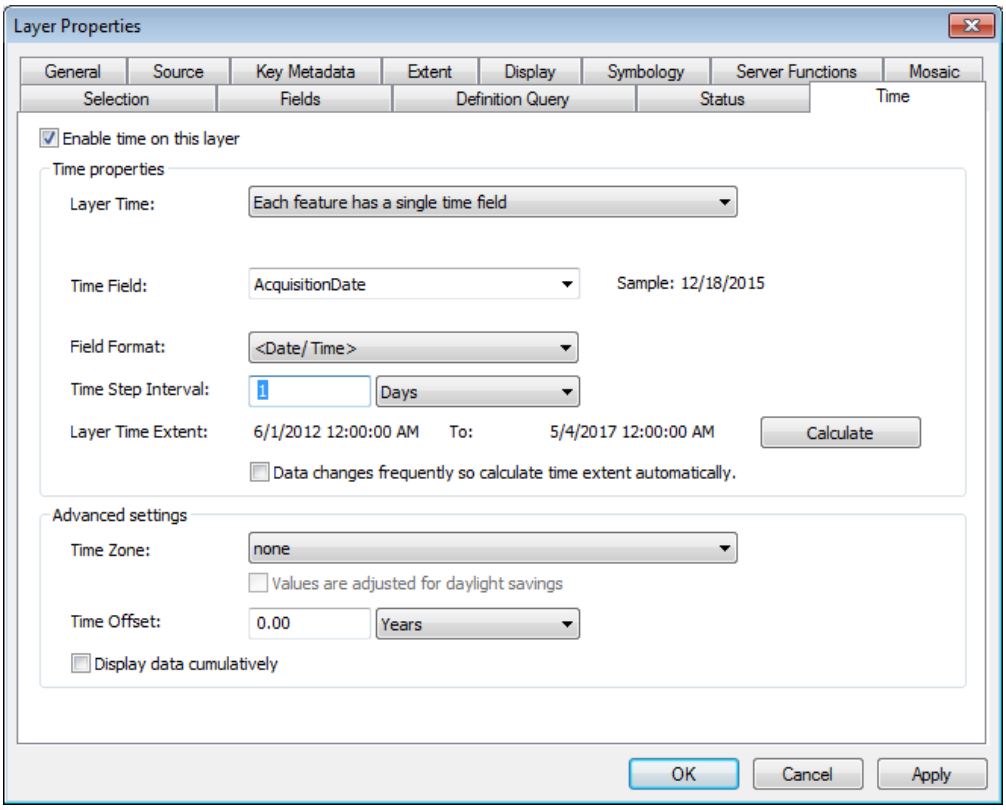
- Double-click one of the layers (e.g., "MODIS_Aqua_CorrectedReflectance_Bands721") to add it to the query box and click "Verify" to ensure it works properly



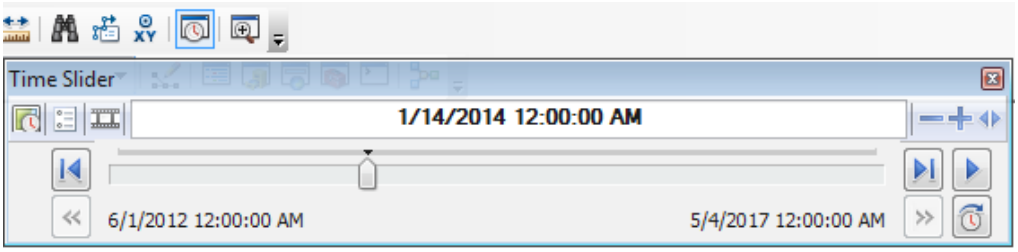
- After clicking OK enough times, you should have imagery on your map for the current day!



- To enable time controls, right-click on MODIS again from your layer panel and click "Properties..."
- Click the "Time" tab and then "Enable time on this layer"
- Change the "Time Step Interval" to 1 Days



- You should then be able to enable the time widget and change the currently displayed date!



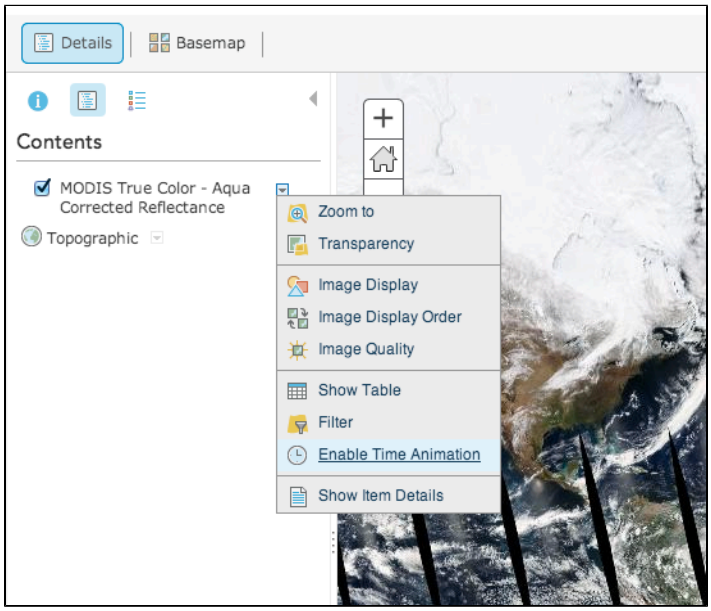
Note: while ArcMap currently supports OGC WMTS layers as does GIBS, the time-varying layers in GIBS are not compatible with ArcMap through WMTS due to the non-standard nature of the "time" parameter in many GIS applications and protocols. The above ESRI relay works around this problem.

ESRI ArcGIS Online

GIBS imagery layers can be imported into ESRI's ArcGIS Online in one of three ways: as a predefined layer, "a Tile Layer", or through an ESRI-run relay service which adds an ArcGIS Server interface layer in front of GIBS.

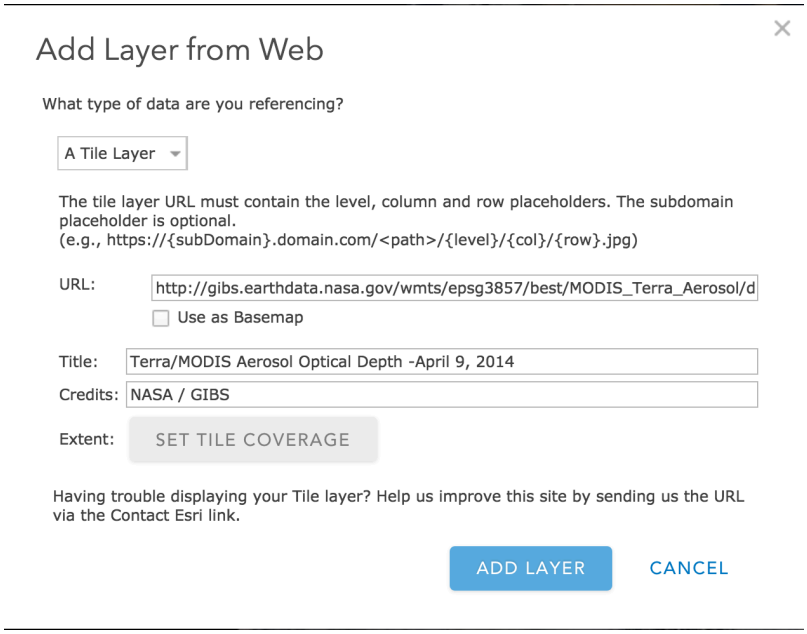
Adding GIBS layers from a list of ones predefined by ESRI

- Search for "Global Imagery Browse Services" in ArcGIS Online and add individual results to your map, such as Aqua/MODIS Corrected Reflectance (True Color).
- To change the currently-displayed date, go to the "Details" pane, then click the small down arrow next to the layer name. Click "Enable Time Animation", then adjust the date at the bottom of the page.



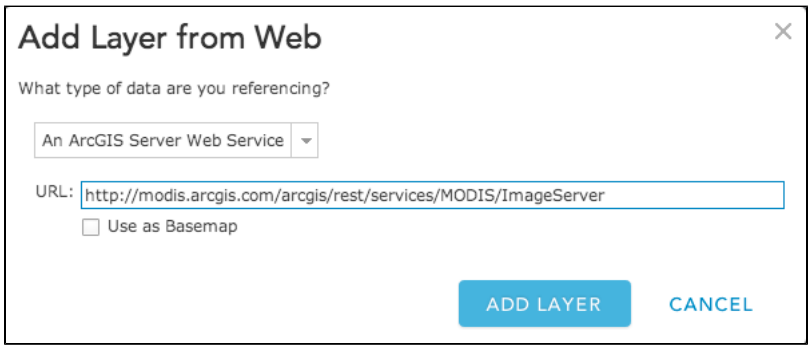
Adding GIBS layers to ArcGIS Online as "A Tile Layer"

- Create a new map or open an existing one in ArcGIS Online
- Click the "Modify Map" button in the upper right corner
- Click the "Add" menu on the left, then "Add Layer from Web"
- Change the service drop down menu to "A Tile Layer"
    - Use the RESTful GIBS WMTS Web Mercator endpoint as the base URL
    - Append the desired time, product, and other layer information to the URL
    - Finally, add the generic "{level}", "{row}", and "{col}.format" entries to the end of the URL. Here is an example entry for displaying Terra/MODIS Aerosol Optical Depth on April 9, 2014:
        - https://gibs.earthdata.nasa.gov/wmts/epsg3857/best/MODIS_Terra_Aerosol/default/2014-04-09/GoogleMapsCompatible_Level6/{level}/{row}/{col}.png
    - Give the layer a title and credits, then click "Add Layer"



Adding GIBS layers to ArcGIS Online as "An ArcGIS Server Web Service"

- Create a new map or open an existing one in ArcGIS Online
- Click the "Modify Map" button in the upper right corner
- Click the "Add" menu on the left, then "Add Layer from Web"
- Change the service drop down menu to "An ArcGIS Server Web Service"
- Add the following URL: http://modis.arcgis.com/arcgis/rest/services/MODIS/ImageServer and click "Add Layer"
- The default layer is Terra/MODIS Corrected Reflectance and is... difficult to change to others. The time is adjustable at the bottom of the screen

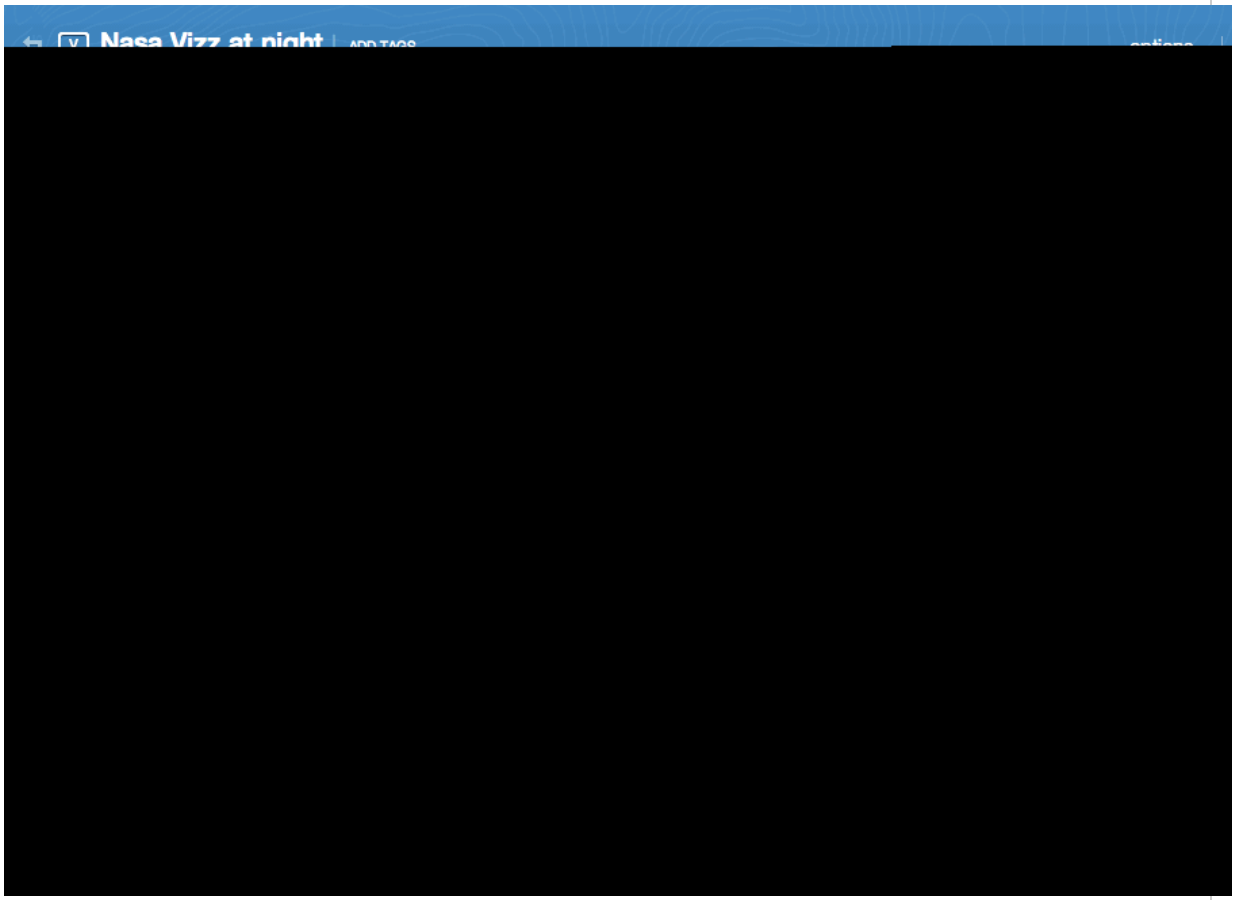


CartoDB

GIBS products can be used directly from within CartoDB. This can be done by adding a basemap from either “NASA” or a generic X/Y/Z template.

Method 1: adding a "NASA" basemap:

- While in "Map view", click the "Basemap" drop-down menu and select "Add yours".
- Select the "NASA" tab, then choose a date. Note that this currently defaults to either the Terra/MODIS Corrected Reflectance (True Color) product or the Suomi NPP/VIIRS/Earth Observatory Earth at Night 2012 layer. To use other GIBS products, see the method below for adding a layer via a generic X/Y/Z template.



Method 2: adding a GIBS layer from a generic X/Y/Z template

- While in "Map view", click the "Basemap" drop-down menu and select "Add yours".
- Select the "XYZ" tab
- Determine which GIBS imagery product you'd like to add, then construct a URL template as follows:
    - https://gibs.earthdata.nasa.gov/wmts/epsg3857/best/<product_name>/default/<date>/<zoom_levels_supported>/{z}/{y}/{x}.<format>
        - product_name: can be found in the "Imagery Layer" column of the Available Products Page or GetCapabilities document
        - date: of the format YYYY-MM-DD
        - zoom_levels_supported: found as the "TileMatrixSet" of your product of interest in the GetCapabilities document, e.g., "GoogleMapsCompatible_Level9"

        - format: "jpg" or "png" as listed in the "format" column of the Available Products Page
    - Sample templates:
        - https://gibs.earthdata.nasa.gov/wmts/epsg3857/best/MODIS_Terra_Land_Surface_Temp_Day/default/2014-04-09/GoogleMapsCompatible_Level7/{z}/{y}/{x}.png
        - https://gibs.earthdata.nasa.gov/wmts/epsg3857/best/MODIS_Aqua_CorrectedReflectance_Bands721/default/2014-04-09/GoogleMapsCompatible_Level9/{z}/{y}/{x}.jpg

SCISS Uniview

Use NASA imagery in your planetarium! The SCISS Uniview software supports access to GIBS imagery through the Tiled WMS service endpoint using the geographic projection (EPSG:4326). The list of available products can be found here.

Google Earth

GIBS can generate KML files to be used with Google Earth. Those KMLs include pointers to GIBS imagery via the NetworkLink keyword. Users have two options on loading KML files into Google Earth as described below.

Requirements

- Google Earth standalone client

Usage (Generate/Download KML file)

Using the information on generating KMLs, you can load that downloaded file from within Google Earth (File | Open) or usually by simply double-clicking on the KML file itself. The layer will show up in the "Temporary Places" within the "Places" window.

Usage (Load from within Google Earth)

After launching Google Earth, choose the "Network Link" item from the "Add" menu. Choose whatever Name you wish and in the "Link" field, insert the appropriate link (e.g., https://gibs.earthdata.nasa.gov/twms/epsg4326/best/kmlgen.cgi?layers=MODIS_Terra_CorrectedReflectance_TrueColor&time=2012-06-21). The list of available layers can be found here. For more details on how to compose a proper KML generation request from the GIBS server, see here.

Limitations (both methods):

- Due to the way NetworkLink is handled in Google Earth for global datasets, you may need to zoom out to a more "global" view before imagery begins loading.
- When using a KML that contains multiple time steps, the time slider by default usually attempts to display the entire time range simultaneously; this can cause a Z-fighting problem where all time steps are fighting to be shown. To correct the problem, narrow the range of currently-shown time to a single day using the time widget.

Perceptive Pixel Client

Perceptive Pixel, a company that makes high-end touch displays such as CNN's Magic Wall, includes a built in WMS client that can be configured to use TWMS. The FeltBoard application allows for a natural user interface to interact with maps and allows arbitrary map layer sizing, rotations, intersections, as well as annotations.

Requirements

- Perceptive Pixel Display + FeltBoard Application

Usage

The FeltBoard application requires the server2.xml file to be updated with the WMS endpoint for each layer. The list of available layers can be found here. The <base_deg> is the size of the most coarse tile in degrees and must be a divisor of 180. The <depth> tag is set to the number of levels in the tile pyramid. This value may not be the entire tile pyramid, rather, the number of levels starting with the tile level that <base_deg> defines. The <wms_options> can be used to define a specific date.

```
<MapTileServer
server_code="MODIS_Aqua_CorrectedReflectance_TrueColor"
server_type="WMSMapServer">
 <server_code>MODIS_Aqua_CorrectedReflectance_TrueColor</se
rver_code>
 <server_name>MODIS AQUA</server_name>
 <db_url>https://gibs.earthdata.nasa.gov/twms/epsg4326/best
/twms.cgi</db_url>
 <base_deg>36</base_deg>
 <depth>6</depth>
 <im_format>Image::IMG_JPG</im_format>
 <boundary>((-180,0),(180,180))</boundary>
 <basis>Projection::B_SPHERICAL</basis>
 <projection>Projection::P_MERCATOR</projection>
 <wms_layers>MODIS_Aqua_CorrectedReflectance_TrueColor</wms
_layers>
 <wms_styles></wms_styles>
 <wms_options>&time=2012-06-18</wms_options>
</MapTileServer>
```

Screenshots

? Unknown Attachment